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ABSTRACT

The historical needs for teacher competence in assessment are being increased as educational reform efforts bring new types of assessment into use. A statewide proportional random sample of 1,220 Maryland high school teachers was surveyed to determine the amount of training they had received in classroom assessment and the sources of that training. There were 538 (44.1%) usable surveys. The survey was primarily designed to determine teacher attitudes and knowledge about the Maryland Writing Test. Results suggest that almost one in five high school teachers of English/language arts, mathematics, science, and social studies report they have no training whatsoever in classroom assessment. Almost half have either no training at all or training from a single source. The training that does take place in college or through inservice programs does not guarantee that teachers are knowledgeable and skillful users of effective classroom assessment techniques. Steps that should be taken to assure teacher readiness for center stage in assessment are discussed. There are 14 tables of study findings and a 23-item list of references. (SLD)

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# "Classroom Teachers Move to Center Stage in the Assessment Arena -- Ready or Not !"

A Research Paper Presented to the
American Educational Research Association
at its Annual Meeting

San Francisco, CA
April 1992

by

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Teachers K-12 Move to Center Stage in the Assessment Arena -- Ready or Not !

## Teachers and Assessment

### The Need for Teacher Competence in Assessment

Teacher competence in classroom assessment has been identified as significant to successful teaching and learning and as one of the six core job functions of teachers (Smith, Silverman, and Borg, 1980; Gullickson, 1986; Rosenfeld, Thornton, and Skurnik, 1986). It has also been found that teachers can spend up to one-third of their instructional time on assessment-related activities (Stiggins, 1987). Moreover, recognition of the importance of assessment for teachers is suggested by the inclusion of evaluation as a topic in the American Association of Colleges for Teacher Education's project on the needed knowledge base for the beginning teacher (Merwin, 1989), the National Education Association's position that teachers need to test (NEA, 1983), Shanker's (1985) position that a teacher's ability to assess pupil performance is critical to success, and the inclusion of diagnosis as one of the five skill components on the National Teacher Examination (Hufker, 1982).

The need for teacher competence in assessment is further suggested by research that has identified specific measurement skills (Schafer, 1991) to address each of the three types of assessments that are most common in today's classrooms (Airasian, 1991), and by the research of Stiggins, Conklin, and Bridgeford (1991) that used task analysis to identify six areas of competence teachers need to accurately assess a wide range of pupil learning.

The above needs for teacher competence in assessment pertain primarily to teacher needs as they relate to daily classroom instructional activities and decisions, and they do not pertain to the pencil-and-paper standardized norm-referenced multiple choice tests that have for so long anchored state-wide assessment programs. Those historical needs for teacher competence in assessment combined with the impending shift away from standardized

testing and toward alternative assessments (in state-wide assessment programs) that will rely on teachers for the preparation of students for the assessments, and possibly for the actual administration and scoring them, makes the imperative for teacher competence in assessment now even stronger than it has ever been. The situation concerning teachers and their training in classroom assessment, while different from the past in some respects, has many similarities to it and the questions remain: "What should teachers know and be able to do in terms of classroom assessment?" and "How will teachers' competence in classroom assessment be ensured?"

The Changing K-12 Assessment Scene

The improvement of American students' academic performance is considered essential if the country is to remain profitable and competitive in an international economy. For this to occur, high school students specifically need to be able to read, write, compute, speak, listen, study productively, reason, and work effectively with others (The College Board, 1984). There seems to be a clear imperative in society to significantly improve K-12 education, as evidenced by the set of national educational goals that were the outcome of The National Governors' conference held in the Fall of 1989 in Charlottesville, Virginia, and the number of governors and legislatures which have or are in the process of mandating education reform in their states. Virtually all of these efforts incorporate assessment in order to document progress.

Pencil-and-paper standardized norm-referenced multiple choice tests have come under new criticism recently. Opponents of their use, along with claiming that those kinds of tests measure too narrow a range of student abilities to be helpful and that their results cause misdirected changes in instructional strategies, have also claimed that results are often flawed because of the selective suppression of lowest individual scores and breached security of test answers. Opponents of pencil-and-paper standardized norm-referenced multiple choice tests, who typically are also supporters of alternative assessments, feel that performance assessments will measure a much wider range of student abilities, will cause

appropriately directed changes in instructional strategies, and that their results will be much less flawed since breached security of test "answers" of performance assessments is of little concern as compared to multiple-choice test "answers." The matter of selective suppression of lowest individual scores could remain a problem, since this depends upon the manner in which those assessments are administered and their results reported (e.g. census administration vs. sampling administration; "Wall-chart" reporting vs. other reporting methods).

The following points of view about the use of standardized tests and the possible use of performance assessments seem to be representative of the discussion on the topic. Albert Shanker, President of the American Federation of Teachers, speaks in negative terms about the continued use of standardized tests, "...Rather than rely on such flawed measures to judge school performance, schools should scrap standardized tests as they are now." (in Rothman, 1989). And perhaps Richard J. Shavelson, Dean of the Graduate School of Education at the University of California at Santa Barbara, best expresses at least one important positive reason for the use of performance assessments when he states "If schools spend three or four weeks a year teaching to a performance based test, at least they will be teaching things they ought to be teaching in ways they ought to be teaching it." (in Rothman, 1989).

Not withstanding the above, as the discussion about the types of assessments to be used in the educational reform movement of the 1990's in America continues, there is a clear move toward the use of performance assessments and away from the use of standardized tests. Perhaps the strongest impetus for the movement away from standardized tests and toward the use of alternatives, including performance assessments, was made in the "Statement of Genuine Accountability" issued by coalition of over thirty-five education and civil rights groups. In that statement, organizations such as the American Federation of Teachers, the Council on Basic Education, the Institute for Learning and Teaching, the National Association of Elementary School Principals, and individuals

including Howard Gardner of Harvard University and Asa Hilliard of Georgia State University exhort the nation's governors to "...set a timetable " for phasing out current standardized tests and replacing them with alternatives and to reduce their reliance on multiple-choice tests "as much and as soon as possible." (*Education Week,* January 31, 1990)

Maryland is but one example of a state in the process of K-12 education reform. In 1989 a Governor's Commission on School Performance submitted its final report to the governor of Maryland. In addition to making seven other recommendations that will have significant impact on public education in Maryland, the report calls for "...the establishment of more comprehensive assessment systems at the state and local levels to identify excellence, to uncover problem areas, and to point the way toward improvement. The state should replace its current testing programs." (Sondheim, 1989).

Maryland and other states, such as Connecticut, California, New York, Kentucky, and Vermont are making fundamental changes in K-12 education. (*Education Week,* January 31, 1990) Teaching and learning will not remain "business as usual;" new roles for students as active learners and teachers as facilitators of learning likely will emerge as two of the outcomes of these changes. Therefore, it is crucial for educators and policy-makers to understand the nature of these changes, how those changes may impact on students and teachers, and it is especially important for them to put into place policies that will provide the "best chance" for these changes truly to make a difference in the outcomes of K-12 education.

Teachers' Roles in New Assessments

The reform initiatives underway in most states seem to have as their focus attempts to answer the following two questions. What should students know and be able to do with what they know when they graduate from high school? and how can it best be determined what students know and can do when they graduate from high school? The first question asks what the outcomes of K-12 education should be while the second question asks what

methodology is best to determine the degree to which those outcomes have been realized. Discussion and debate about what the outcomes of K-12 education should be is interesting to all educators; however, this paper will briefly discuss the methodologies that seem likely to be used to measure student achievement outcomes and then will concentrate on the role teachers will likely play in new state-wide assessment programs. Of special interest are questions of whether teachers are ready for those new roles and if they are not ready for them, what can be done to prepare teachers for them?

It is becoming increasingly clear that the K-12 educational reform currently under way in the United States will likely include new assessments intended to determine students' academic achievement. It is also clear that at least some of the assessments used for this purpose, such as performance assessments, will require teachers to be active participants in the assessment activity and/or at least in the preparation of their students for the assessments. This active role in assessment activities is both new and not new for teachers. The active role is new in the sense that teachers in the past have participated in state-wide assessments primarily as proctors of the pencil-and-paper standardized norm-referenced multiple choice tests that have dominated large-scale assessments for the past 30 years (Jett, 1991); however, an active role in the classroom assessment of student performance is not new to teachers since they, in fact, spend up to one-third of their instructional time engaged in such activities (Stiggins, 1987).

Because of the impending changes in K-12 education as indicated above, it is likely that classroom teachers will, in addition to becoming active participants in state-wide assessments of their students' academic achievement, be expected to use assessment activities in their daily teaching that are instructionally sound which means that the often used phrase "blurring the line between instruction and assessment" is likely to become a reality in many teachers' classrooms in the not too distant future. Teachers may be expected to design, administer, and evaluate the results of classroom assessments as they relate to the desired instructional outcomes of the course they are teaching, and as they relate to the

desired outcomes of the state-wide assessment teachers' students will encounter. Thus, a crucial factor to the success of K-12 educational reform seems to be the knowledge and skill levels of classroom teachers related to classroom and other forms of assessment. The questions in this regard that seem to need urgent answers are: How well equipped are present teachers in terms of their knowledge and skill in assessment activities? and What actions should take place to ensure that teachers in the future will be knowledgeable and skillful assessment practitioners?

Teachers' Training in Assessment

Teachers' training in classroom assessment has historically been sparse and when it does occur, the topics taught are not relevant to teachers' daily classroom assessment activities therefore are often misdirected (Schafer and Lissitz, 1987 ). Although teachers are responsible for the design and construction of classroom assessment environments, they have little formal training that would assist in those activities (Coffman, 1983; Ward, 1982). Many teachers complete little or no course work and do not participate in inservice training on the topic (Stiggins, Bridgeford, and Conklin, 1991). Moreover, states have not required teachers to be trained in assessment as a condition of professional certification (Noll, 1955; Stinnet, 1969; Woeller, 1979; Burdin, 1982; Schafer and Lissitz, 1987; O'Sullivan and Chalnick, 1991). This condition of not requiring teachers to demonstrate competence (or even to have completed a specific number of credits) in assessment continues today as reported by O'Sullivan and Chalnick (1991) whose findings are consistent with those of the previously cited researchers who identified this problem as early as 1955 (Noll). O'Sullivan and Chalnick report

> "...the most optimistic interpretation of the information gathered indicates that fewer than a third of the 51 teacher certification agencies require specific course work or enumerate competencies in education tests and measurement for initial certification (1991). This implies that the vast majority of teachers entering the profession are deficient in measurement training (p.18)."

Using O'Sullivan and Chalnick's findings, for every 10 teachers teaching in K-12 education, fewer than four of them have been required to complete one or more courses in classroom assessment in order to become certified by state education licensing agencies. This suggests that about six out of ten teachers who are currently in the nation's classrooms have not had formal course training in classroom assessment.

These proportions, when extrapolated to represent the entire teaching population nationwide, suggest the magnitude of the discrepancy between the identified, researched, and validated need for teachers to be trained in classroom assessment since the outcomes of education depend so heavily upon it, and the reality of the number and percent of teachers who have received such training, whether or not it was required for certification to teach.

Current Research About Teachers' Training in Classroom Assessment

Our findings concerning teachers' training in classroom assessment provides further evidence that teachers are generally untrained to carry out classroom assessment activities. A statewide proportional random sample of Maryland high school teachers was surveyed to determine, in part, the amount of training they received in classroom assessment and the source of that training. The findings associated with this research effort are based on the responses contained on 538 (44.1% return of 1220) usable surveys.

The Survey Instrument

The study design sought to collect information concerning teachers' training in classroom assessment from a sample of high school English/language arts, mathematics, science, and social studies teachers that would be representative of the statewide population of high school teachers who teach in those academic disciplines. A twenty-eight item survey, primarily intended to determine teachers' knowledge about and attitudes toward a performance assessment, the Maryland Writing Test, that also contained three items directly

related to teachers' training in classroom assessment, was used for this purpose. The three survey items directly related to teachers' training in classroom assessment were

1. Have you earned college credit for taking one or more courses in classroom measurement? ____ yes ____ No
2. Have you ever taken another course in which classroom measurement was a part? ____ yes ____ No
3. Have you ever taken an inservice course in classroom measurement? ____Yes ____ No

Seven other items on the survey asked respondents to provide the following demographic information

1. the academic subject taught
2. the number of years taught
3. the school system in which they teach
4. the highest degree earned
5. their sex
6. their race
7. their happiness as teachers

Distribution and Return of Survey Instruments

The survey instruments were distributed, through a proportional random sampling procedure, to 1,220 teachers of English/language arts, mathematics, science, and social studies in the 24 public school systems in Maryland who currently teach in those academic disciplines for a majority of the school day. Surveys were returned from teachers in all twenty-four of the public school systems in Maryland.

Table 1 provides information about the distribution and return of the surveys used in this study. Surveys were distributed proportionately according to the percent of statewide teachers who teach students in grades seven to 12. Column two indicates the total number of teachers surveyed in each school system while column five indicates the percent of all teachers surveyed in the state for each school system. Column three indicates

the number and column four shows the percent of surveys returned for each school system. Column six shows the percent of statewide surveys that were returned from each school system.

It is important to note from Table 1 the statewide distribution of surveys and return rates. Comparing columns five and six reveals that the percent of returned surveys from each school system closely approximates the percent of surveys distributed in each school system. Moreover, the range of return rates, as seen in column four of Table 1 extends from a low of 25.0 percent to a high of 83.3 percent. Ten school systems have return rates below the statewide average of 44.1, and 14 school systems have return rates above the statewide average of 44.1. These data indicate that teachers who returned surveys for this study are a representative statewide sample of Maryland high school teachers who would respond to such a survey since they represent all 24 public school systems in approximately the same proportion as the total number of teachers who teach students in grades 7 to 12 in their school systems.

Table 1
Distribution and Return of Surveys by School System

| School System | Number of Teachers Surveyed | Number of Surveys Returned | Percent of Surveys Returned | Percent of All Teachers Surveyed | Percent of All Surveys Returned |
|---|---|---|---|---|---|
| Allegany | 20 | 11 | 55.0 | 1.6 | 2.0 |
| Anne Arundel | 104 | 60 | 57.7 | 8.7 | 11.2 |
| Baltimore City | 148 | 56 | 37.8 | 12.2 | 10.4 |
| Baltimore Co. | 168 | 71 | 42.3 | 14.1 | 13.2 |
| Calvert | 16 | 4 | 25.0 | 1.3 | 0.7 |
| Caroline | 12 | 8 | 75.0 | 1.0 | 1.5 |
| Carroll | 40 | 16 | 48.0 | 3.3 | 3.0 |
| Cecil | 24 | 16 | 66.7 | 2.0 | 3.0 |
| Charles | 28 | 12 | 42.9 | 2.4 | 2.2 |
| Dorchester | 12 | 5 | 41.7 | 1.0 | 0.9 |
| Frederick | 44 | 17 | 38.6 | 3.7 | 3.2 |
| Garrett | 12 | 7 | 58.3 | 1.0 | 1.3 |
| Harford | 52 | 23 | 53.9 | 4.4 | 4.3 |
| Howard | 56 | 25 | 44.6 | 4.5 | 4.7 |
| Kent | 12 | 5 | 41.7 | 1.0 | 0.9 |
| Montgomery | 172 | 75 | 43.6 | 14.1 | 13.9 |
| Prince George's | 176 | 60 | 34.1 | 14.4 | 11.2 |
| Queen Anne's | 12 | 6 | 50.0 | 1.0 | 1.1 |
| Somerset | 12 | 10 | 83.3 | 1.0 | 1.9 |
| St. Mary's | 24 | 18 | 75.0 | 1.9 | 3.3 |
| Talbot | 12 | 8 | 75.0 | 1.0 | 1.5 |
| Washington | 32 | 12 | 37.5 | 2.6 | 2.2 |
| Wicomico | 20 | 9 | 45.0 | 1.7 | 1.7 |
| Worcester | 12 | 4 | 33.3 | 1.0 | 0.7 |
| Statewide Totals | 1,220 | 538 | 44.1 | | |

Selected Demographic Information About Survey Respondents

Although the sampling procedures used in this study identified an equal number of English/language arts, mathematics, science, and social studies teachers for participation,

teachers in those areas did not return surveys in equal numbers. Table 2 shows the number of surveys returned by teachers in each of the four academic disciplines. Mathematics, science, and social studies teachers statewide participated in this study in relatively equal and almost identical numbers while English/language arts teachers participated in it at a rate that is over 30 percent higher than teachers in the other three academic disciplines.

Column two of Table 2 shows the number of teachers statewide in English/language arts, mathematics, science, and social studies who returned surveys while column three shows the percent of all surveys returned by each group. Survey returns by English/language arts teachers represent 31.0 percent of all surveys returned, while those returned by mathematics teachers represent 23.6 percent of the total, science teachers represent 22.5 percent of the total, and social studies teachers represent 22.9 percent of the total. These data indicate that teachers in three of the four academic disciplines have approximately equal representation in the statewide sample, while English/language arts is over-represented when compared to the other academic areas. This is likely due to the context of the survey, the Maryland Writing Test, which may receive greater emphasis in English/language arts curricula.

Table 2
Distribution of Survey Respondents by Academic Subject Taught

| Subject | Number of Survey Respondents | Percent of Total Survey Respondents |
|---|---|---|
| English/Language Arts | 167 | 31.0 |
| Mathematics | 127 | 23.6 |
| Science | 121 | 22.5 |
| Social Studies | 123 | 22.9 |
| Total | 538 | |

Of the 538 surveys returned 294, or 54.7 percent, were returned by female teachers and 218, or 40.5 percent, were returned by male teachers. An additional 26 surveys, or 4.8

percent, were returned by teachers who declined to indicate their sex. Although this item was listed as optional on the survey, 95.2 percent of respondents chose to respond to it. The percent of female and male teachers who indicated their sex on the survey compares favorably with the percent of female and male high school teachers statewide which are 56.1 percent female teachers and 43.9 percent male teachers.

Participants in the study also responded to other optional items on the survey in significant numbers. One item asked them to identify their race and over 93 percent of them did. Table 3 provides information relative to the race of survey respondents. Caucasians represent 87.2 percent of the survey sample while Blacks represent 8.8 percent, Hispanics represent 1.0 percent, Asians and American Indians each represent 0.8 percent, 1.4 percent indicate their race as "Other," and 37 or 6.9 percent chose not to respond to the item. These percents, except for Black respondents, compare favorably to those of all high school teachers statewide which are 81.9 percent Caucasian, 16.6 percent Black, and 1.5 percent Other.

Table 3
Distribution of Survey Respondents by Race

| Race | Number | Percent | Statewide Percent |
|---|---|---|---|
| American Indian | 4 | 0.8 | * |
| Asian | 4 | 0.8 | * |
| Black | 44 | 8.8 | 16.6 |
| Caucasian | 437 | 87.2 | 81.9 |
| Hispanic | 5 | 1.0 | * |
| Other | 7 | 1.4 | 1.5* |
| Total | 501 | 100.0 | 100.0 |
| Missing | 37 | 6.9 | |

Note. *Statewide data for American Indian, Asian, and Hispanic grouped under "Other". Source of Statewide Percents: Maryland State Department of Education, 1990.

In response to an item on the survey used in this study, respondents indicated the number of years they have been a high school teacher. The range of teaching experience among respondents was from one to 39 years. Respondents were grouped in three-year intervals by the number of years they have been a high school teacher, with one group that included teachers who had taught 28 or more years. This last group has a number of years of teaching interval of 12 years.

Table 4 shows the distribution of survey respondents by the number of years they have taught. The distribution of respondents by number of years they have been teachers is fairly even across the number of years teaching categories, with the exception of the number of teachers who have been teaching for 28 or more years. There are 30 survey respondents in this category. Two other categories have fewer teachers than the average of 48.9 teachers in them. Those categories are teachers with three or fewer years (42 respondents) and teachers with seven to nine years (46 respondents) of teaching experience. All other categories of numbers of years as a teacher are above the average of 48.9 respondents and are very similar or identical to each other.

The mean number of years as a teacher for all respondents was 15.3 years. There were 51.0 percent of survey respondents in the first half of a normal 30-year teaching career.

Table 4
Distribution of Survey Respondents by the Number of Years Taught

| Number of Years Taught | Number of Respondents | Percent of Respondents | Cumulative Percent |
|---|---|---|---|
| 3 or fewer years | 42 | 7.8 | 7.8 |
| 4 to 6 years | 58 | 10.8 | 18.6 |
| 7 to 9 years | 46 | 8.6 | 27.2 |
| 10 to 12 years | 63 | 11.7 | 38.9 |
| 13 to 15 years | 65 | 12.1 | 51.0 |
| 16 to 18 years | 62 | 11.5 | 62.5 |
| 19 to 21 years | 62 | 11.5 | 74.0 |
| 22 to 24 years | 59 | 11.0 | 85.0 |
| 25 to 27 years | 51 | 9.5 | 94.5 |
| 28 or more years | 30 | 5.6 | 100.0 |
| Total | 538 | | |

Mean = 15.3 years

Survey respondents reported their degree status in terms of the highest degree earned and the results are summarized in Table 5. Master's degrees are the highest degree earned for 388 or 72.1 percent of survey respondents while 141 or 26.2 percent have Bachelor's degrees, and nine or 1.7 percent have Doctor's degrees.

Table 5
Distribution of Survey Respondents by Highest Degree Earned

| Highest Degree Earned | Number of Respondents | Percent of Respondents |
|---|---|---|
| Bachelor's | 141 | 26.2 |
| Master's | 388 | 72.1 |
| Doctor's | 9 | 1.7 |
| Total | 538 | |

Findings Relative to Teacher Training in Classroom Assessment

In order to determine high school teachers' educational training in classroom assessment, survey respondents were asked to provide information concerning whether or not they had earned college or inservice credit in courses that dealt specifically with classroom assessment of student achievement, and in other courses that had at least a major component in classroom assessment of student achievement. In the following tables and the discussion concerning them, these terms will be used and have the meaning indicated.

1. Assessment Course -- a college course specifically designed to teach students about classroom measurement theory and techniques
2. Other Course -- a college course in which classroom assessment theory and techniques were part of the overall course of study
3. Inservice -- a course in classroom assessment taken after employment as a teacher and offered by other than a college or university, e.g. a school system

While there certainly are other opportunities for survey respondents to have received training in classroom assessment, including on-the-job-training, peer coaching, and others, it is our view that the above three methods are the most likely means for teachers to receive structured, planned, and meaningful training in classroom assessment. Therefore, absent any training through one or more of those means it seems likely that currently employed teachers are untrained in the theory and practice associated with classroom assessment. That said, however, we would emphasize that merely completing course requirements through any of the above three means in no way implies competency in the effective use of classroom assessment theory and techniques by those who completed the courses. Successful completion of such courses, however does suggest there is a greater likelihood that the teacher has some knowledge, understanding, and, hopefully, skill in classroom assessment.

Table 6 summarizes the amount and source of training in classroom assessment survey respondents reported they received. Over 65 percent of all teacher respondents reported they earned college credit in a course that specifically dealt with classroom assessment; over 62 percent reported they have earned college credit in a course that had at least a major component in classroom assessment; and 26.4 percent reported they earned inservice credit in classroom assessment.

Table 6
College or Inservice Credit Earned by Survey Respondents in Classroom Assessment

| Was College Credit Earned In Classroom Measurement Course ? | Number of Respondents | Percent of Respondents |
|---|---|---|
| Yes | 351 | 65.4 |
| No | 186 | 34.6 |
| Total | 537 | 100.0 |
| Missing | 1 | 0.2 |

| Was College Credit Earned in Other Course That Included Classroom Measurement? | Number of Respondents | Percent of Respondents |
|---|---|---|
| Yes | 338 | 63.7 |
| No | 193 | 36.3 |
| Total | 531 | 100.0 |
| Missing | 7 | 1.3 |

| Was Inservice Credit in Classroom Measurement Earned? | Number of Respondents | Percent of Respondents |
|---|---|---|
| Yes | 142 | 26.7 |
| No | 389 | 73.3 |
| Total | 531 | 100.0 |
| Missing | 7 | 1.30 |

Table 7 presents information concerning the number and percent of survey respondents with training in classroom assessment by subject taught and sources of training. Among teachers in the four academic disciplines, there is little difference in terms of the percent of them who earned credit in one or more assessment courses. A slightly higher percentage of mathematics teachers (69.5%) earned credit in assessment courses than did English (63.5%), science(64.5%), and social studies(64.8%) teachers. Overall, 65.4 percent of survey respondents indicated they received credit in assessment courses.

The difference in the percents of survey respondents who earned credit in other courses and inservice is greater than was observed in the percents who earned credit in assessment courses. For example, a low of 56.3 percent of mathematics teachers reported earning credit in other courses and 21.4 percent of them earned credit through inservice. The highest percentage of teachers earning credit in other courses were science teachers (69.2%), and English teachers (33.5%) reported the highest percentage who earned credit through inservice.

Table 7
Number and Percent of Survey Respondents With Training in Classroom Assessment by Subject Taught and Sources of Training

| Subject Taught | N | Sources of Training | | |
|---|---|---|---|---|
| | | Assessment Course | Other Course | Inservice |
| English/language Arts | 167 | 106<br>63.5 | 104<br>63.4 | 55<br>33.5 |
| Mathematics | 127 | 88<br>69.5 | 71<br>56.3 | 27<br>21.4 |
| Science | 121 | 70<br>64.5 | 83<br>69.2 | 34<br>28.3 |
| Social Studies | 123 | 79<br>64.8 | 80<br>66.1 | 26<br>21.5 |
| Total | 538 | 351<br>65.4 | 338<br>63.7 | 142<br>26.7 |

Note: Counts are duplicated since some teachers reported they received training from more than one source.

Information concerning the number and percent of survey respondents with training in classroom assessment by number of years taught and sources of training are presented in Table 8. Teachers are grouped in three year intervals according to the length of time they have taught, except for the 28 or more years taught category which contains a 12 year interval. The range of percents of teachers with training in classroom assessment through an assessment course is from a low of 54.9 (25 to 27 years taught) to a high of 80.0 (28 or more years taught).

Overall the percent of survey respondents with training in classroom assessment through other courses is 63.7 percent which is similar to the percent with training in classroom assessment through assessment courses (65.4 percent). As a group, however, a

lower percentage of survey respondents who have taught for fewer years have obtained training in classroom assessment through other courses. Especially noteworthy may be the observation that only 42.9 percent of survey respondents who have taught for 3 or fewer years have received training in classroom assessment through other courses as compared to the next lowest percentage (56.9 for 13 to 15 years) and to the total percent which is 63.7.

The highest percentage(58.6) of survey respondents who received training in classroom assessment through inservice are in the 28 or more years taught category while the lowest percentage (19.5) are in the 3 or fewer years category. Overall, 26.7 percent of survey respondents have received training in classroom assessment through inservice.

Table 8
Number and Percent of Survey Respondents With Training in Classroom Assessment by Number of Years Taught and Sources of Training

| Number of Years Taught | N | Sources of Training | | |
|---|---|---|---|---|
| | | Assessment Course | Other Course | Inservice |
| 3 or fewer | 42 | 25<br>61.0 | 18<br>42.9 | 8<br>19.5 |
| 4 to 6 years | 58 | 45<br>78.9 | 41<br>70.7 | 14<br>24.6 |
| 7 to 9 years | 46 | 28<br>60.9 | 28<br>60.9 | 10<br>21.7 |
| 10 to 12 years | 63 | 35<br>55.6 | 39<br>61.9 | 20<br>31.7 |
| 13 to 15 years | 65 | 39<br>60.9 | 37<br>56.9 | 17<br>27.0 |
| 16 to 18 years | 62 | 35<br>57.4 | 46<br>74.2 | 16<br>25.8 |
| 19 to 21 years | 62 | 43<br>70.5 | 41<br>67.2 | 19<br>31.1 |
| 22 to 24 years | 59 | 38<br>65.5 | 41<br>69.5 | 15<br>25.9 |
| 25 to 27 years | 51 | 28<br>54.9 | 36<br>70.6 | 11<br>21.6 |
| 28 or more years | 30 | 24<br>80.0 | 22<br>75.9 | 12<br>58.6 |
| Total | 538 | 351<br>65.4 | 338<br>63.7 | 142<br>26.7 |

Note: Counts are duplicated since some teachers reported they received training from more than one source.

Table 9 presents the number and percent of survey respondents with training in classroom assessment by highest degree earned. Because the number of respondents

holding Doctor's degrees is relatively small as compared to the numbers of respondents holding Bachelor's and Master's degrees, meaningful comparisons concerning the sources of training in classroom assessment for respondents with Doctor's degrees cannot be made. When comparing the sources of training in classroom assessment for survey respondents holding Bachelor's and Master's degrees only small differences are found in the percent of respondents with training from each of the three sources. For example, 61.7 percent of Bachelor's degree holding respondents reported having received training in classroom assessment in an assessment course while 66.4 percent of Master's degree holding respondents reported receiving training from the same source. The comparative percents for Bachelor's and Master's degree holders receiving training in classroom assessment from other courses were 66.5 percent and 62.9 percent, respectively; and for inservice training they were 25.2 percent and 26.9 percent respectively.

Table 9
Number and Percent of Survey Respondents With Training in Classroom Assessment by Highest Degree Earned and Sources of Training

| | | Sources of Training | | |
|---|---|---|---|---|
| Highest Degree Earned | N | Assessment Course | Other Course | Inservice |
| Bachelor's | 141 | 87<br>61.7 | 91<br>65.5 | 35<br>25.2 |
| Master's | 388 | 257<br>66.4 | 241<br>62.9 | 103<br>26.9 |
| Doctor's | 9 | 7<br>77.8 | 7<br>77.8 | 4<br>44.4 |
| Total | 538 | 351<br>65.4 | 345<br>29.0 | 142<br>26.7 |

Note: Counts are duplicated since some teachers reported they received training from more than one source.

The above tables provide some information about the sources of training survey respondents received in classroom assessment according to selected demographic variables that is somewhat helpful in understanding the sources of teachers' training; however, its usefulness is somewhat limited because the tables that present information concerning the sources of teachers' training in classroom assessment contain duplicated counts of the sources of that training. Because of the duplicate counts, the data thus far presented do not identify how many teachers received training in classroom assessment from one, two, or all three of the identified sources; or whether or not they received any training in classroom assessment whatsoever.

Since there were three possible sources of training in classroom assessment, the following eight combinations or possibilities existed for each survey respondent in terms of their status in having received such training. Survey respondents could have received training from the following sources and combination of sources.

1. Assessment course, other course, and inservice
2. Assessment course and other course
3. Assessment course and inservice
4. Other course and inservice
5. Assessment course only
6. Other course only
7. Inservice only
8. None (no training in classroom assessment from any of the three sources)

Responses were categorized according to one of the eight categories above with respect to the amount of and sources of training they received in classroom assessment. Because the eight categories included all possibilities in terms of amount of and sources of training in classroom assessment used in this research, each survey respondent could be in one and only one category. The resultant data was then analyzed across the following five demographic areas and are presented below.

1. Race
2. Sex
3. Subject taught
4. Number of years taught
5. Total sample

Table 10 presents information about the number and percent of survey respondents by race and sources of training. All six race categories are reported in the table; however, the numbers of respondents in all but two of the categories (Black and Caucasian) are too few to conduct meaningful analysis.

The highest percentage (29.5) of Black respondents was in category one which means they received training in classroom assessment from all three sources. The next highest percentage (22.7) of Black respondents was in category eight which means they received no training in classroom assessment from any of the three sources identified in this research. As for Caucasian survey respondents, the highest percentage (32.2) were in category two which means they received training in classroom assessment from assessment courses and other courses. The next highest percentage (17.4) of Caucasian respondents was in category one which means they received training in classroom assessment from all three sources. For Caucasian respondents, 16.5 percent report they received no training in classroom assessment from any of the three sources. In addition, 52.2 percent of Blacks and 43.9 percent of Caucasians received either no training in classroom assessment or received training from only one of the three sources.

Table 10
Number and Percent of Survey Respondents by Race and Sources of Training

| Sources of Training | Race | | | | | |
|---|---|---|---|---|---|---|
| | American Indian N=4 | Asian N=4 | Black N=44 | Caucasian N=437 | Hispanic N=5 | Other N=7 |
| 1. Assessment course, Other course, and Inservice | 1<br>25.0 | 0<br>0.0 | 13<br>29.5 | 76<br>17.4 | 1<br>20.0 | 2<br>28.6 |
| 2. Assessment course and Other course | 2<br>50.0 | 0<br>0.0 | 5<br>11.4 | 141<br>32.3 | 3<br>60.0 | 1<br>14.3 |
| 3. Assessment course and Inservice | 0<br>0.0 | 0<br>0.0 | 0<br>0.0 | 12<br>2.7 | 0<br>0.0 | 0<br>0.0 |
| 4. Other course and Inservice | 0<br>0.0 | 0<br>0.0 | 3<br>6.8 | 16<br>3.7 | 0<br>0.0 | 1<br>14.3 |
| 5. Assessment course only | 0<br>0.0 | 0<br>0.0 | 6<br>13.6 | 67<br>15.3 | 0<br>0.0 | 1<br>14.3 |
| 6. Other course only | 0<br>0.0 | 2<br>50.0 | 6<br>13.6 | 46<br>10.5 | 0<br>0.0 | 1<br>14.3 |
| 7. Inservice only | 0<br>0.0 | 1<br>25.0 | 1<br>2.3 | 7<br>1.6 | 0<br>0.0 | 0<br>0.0 |
| 8. None | 1<br>25.0 | 1<br>25.0 | 10<br>22.7 | 72<br>16.5 | 1<br>20.0 | 1<br>14.3 |
| N=501 | | | | | | |

Table 11 presents information about the number and percent of survey respondents with training in classroom assessment by sex and sources of training. The highest percentage (31.3) of female respondents was in category two which means they received training in classroom assessment from assessment courses and other courses. The next highest percentage (14.3) of female respondents was in category one which means they received training in classroom assessment from all three sources identified in this research. As for male survey respondents, the highest percentage (28.9) were in category two which means they received training in classroom assessment from assessment courses and other courses. The next highest percentage (23.4) of male respondents was in category one which means they received training in classroom assessment from all three sources. For male respondents, 14.7 percent report they received no training whatsoever in classroom assessment from any of the three sources identified in this research while the percent of females in this category was 20.1. In addition, 47.6 percent of female and 41.8 percent of males received either no training in classroom assessment or received training from only one of the three sources.

A chi-square = 14.92, df=7, p=.04 does not allow rejection of the hypothesis that the amount and source of training received by teachers in this population are independent of their sex.

Table 11
Number and Percent of Survey Respondents by Sex and Sources of Training

| Sources of Training | Sex | |
|---|---|---|
| | Female N=294 | Male N=218 |
| 1. Assessment course, Other course, and Inservice | 42<br>14.3 | 51<br>23.4 |
| 2. Assessment course and Other course | 92<br>31.3 | 63<br>28.9 |
| 3. Assessment course and Inservice | 7<br>2.4 | 5<br>2.3 |
| 4. Other course and Inservice | 13<br>4.4 | 8<br>3.7 |
| 5. Assessment course only | 36<br>12.2 | 39<br>17.9 |
| 6. Other course only | 38<br>12.9 | 18<br>8.3 |
| 7. Inservice only | 7<br>2.4 | 2<br>0.9 |
| 8. None | 59<br>20.1 | 32<br>14.7 |

N=512

Information about the number and percent of survey respondents by the subject survey respondents taught and sources of their training is presented in Table 12. For English/language arts teachers, the two sources of training categories with the highest percentage of respondents are category two (25.7), assessment courses and other courses, and category one (24.0), training was received from all three sources. Category three, assessment course and inservice training, had the lowest percentage (1.8) of

English/language arts teachers. Twenty-four and six tenths (24.6) percent of English/language arts teachers had training in classroom assessment from a single one of the three sources while an additional twenty and four tenths (20.4) percent of English/language arts teachers reported receiving no training whatsoever in classroom assessment from any of the three sources identified in this research.

For mathematics teachers, the two sources of training categories with the highest percentage of respondents are category two (30.7), assessment courses and other courses, and category five (21.3), training received from assessment courses only. Category seven, inservice only, had the lowest percentage (1.6) of mathematics teachers. Thirty-two and three tenths (32.3) percent of mathematics teachers had training in classroom assessment from a single one of the three sources while an additional seventeen and three tenths (17.3) percent of mathematics teachers reported receiving no training whatsoever in classroom assessment from any of the three sources identified in this research.

For science teachers the two sources of training categories with the highest percentage of respondents are category two (27.3), assessment courses and other courses, and category one (17.8), training was received from all three sources. Category seven, inservice only, had the lowest percentage (0.8) of science teachers. Thirty-two and two tenths (32.2) percent of science teachers had training in classroom assessment from a single one of the three sources while an additional thirteen and two tenths (13.2) percent of science teachers reported receiving no training whatsoever in classroom assessment from any of the three sources identified in this research.

For social studies teachers, the two sources of training categories with the highest percentage of respondents are category two (34.1), assessment course and other course, and category eight (20.3), no training whatsoever received from any of the three sources. Category seven, inservice training, had the lowest percentage (0.0) of social studies teachers. Twenty-six (26.0) percent of social studies teachers had training in classroom assessment from a single one of the three sources while an additional twenty and three

tenths (20.3) percent of social studies teachers reported receiving no training in classroom assessment from any of the three sources identified in this research.

Table 12
Number and Percent of Survey Respondents by Subject Taught and Sources of Training

| Sources of Training | Subject Taught | | | |
|---|---|---|---|---|
| | English N=167 | Mathematics N= 127 | Science N=121 | Social Studies N=123 |
| 1. Assessment course, Other course, and Inservice | 40<br>24.0 | 17<br>13.4 | 24<br>17.8 | 19<br>15.4 |
| 2. Assessment course and Other course | 43<br>25.7 | 39<br>30.7 | 33<br>27.3 | 42<br>34.1 |
| 3. Assessment course and Inservice | 3<br>1.8 | 5<br>3.9 | 2<br>1.7 | 2<br>1.6 |
| 4. Other course and Inservice | 6<br>3.6 | 3<br>2.4 | 7<br>5.8 | 5<br>4.1 |
| 5. Assessment course only | 20<br>12.0 | 27<br>21.3 | 19<br>15.7 | 16<br>13.0 |
| 6. Other course only | 15<br>9.0 | 12<br>9.4 | 19<br>15.7 | 16<br>13.0 |
| 7. Inservice only | 6<br>3.6 | 2<br>1.6 | 1<br>0.8 | 0<br>0.0 |
| 8. None | 34<br>20.4 | 22<br>17.3 | 16<br>13.2 | 25<br>20.3 |
| N=538 | | | | |

Table 13 presents information relative to the number and percent of survey respondents by the number of years taught and the sources of their training. There are ten number-of-years-taught categories and eight sources of training in classroom assessment categories across which data are presented. Analysis of data is perhaps most clear if

presented by sources of training categories rather than by number-of-years-taught categories.

Survey respondents who have taught in years from 10 to 12 (25.4), 19 to 21 (25.8), and 28 or more (30.0) have the highest percentage in terms of having received training in category one, assessment course, other course, and inservice. The three or fewer number-of-years-taught category has the lowest percentage (7.1) of respondents with training in this category.

Survey respondents who have taught in years from 4 to 6 (37.9) and 25 to 27 (33.3) have the highest percentage insofar as having received training in category two, assessment course and other course. Respondents who have taught from 10 to 12 years had the lowest percent (17.5) who have received training in classroom assessment through assessment course and other course.

Category three of the sources of training categories in classroom assessment, assessment course and inservice, had a total of 12 respondents in it with the 25 to 27 number-of-years-taught category having the most, three. Category four of the sources of training categories, other course and inservice, also had few respondents in it, twenty-one. Four of those twenty-one respondents, however, were in the 3 or fewer number-of-years-taught category which represented 9.5 percent of all teachers in that number-of-years-taught category.

In categories five, six, and seven of the sources of training categories, all of which are single sources of training in classroom assessment, more respondents had assessment course as a single source of training (82), followed by other course (60), with inservice as the only source of training having only nine (9) respondents in that category. Noteworthy among the numbers and percents in those three categories is the fact that 24.2 percent of teachers who have taught for from 16 to 18 years have received classroom assessment training from an assessment course only, that 23.8 percent of teachers of teachers who have taught three or fewer years have received classroom assessment training from an other

course only, and that only nine respondents have inservice training as their only source of training in classroom assessment.

In the no-training category, 23.8 percent of the respondents who have taught from 10 to 12 years, 23.1 percent of the respondents who have taught from 13 to 15 years, and 21.4 percent of the respondents who have taught three or fewer years are in category eight and report no training in classroom assessment from any of the three sources identified in this research. The number-of-years-taught category with the lowest percentage of teachers with no training from any of the three sources identified in this research is the 28 or more years taught category (6.7).

Table 13
Number and Percent of Survey Respondents With Training in Classroom Assessment by Number of Years Taught and Sources of Training

| Sources of Training | Number of Years Taught | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 or Fewer | 4 to 6 | 7 to 9 | 10 to 12 | 13 to 15 | 16 to 18 | 19 to 21 | 22 to 24 | 25 to 27 | 28 or More |
| 1. Assessment Course, Other course, and Inservice | 3<br>7.1 | 11<br>19.0 | 7<br>15.2 | 16<br>25.4 | 9<br>13.8 | 10<br>16.1 | 16<br>25.8 | 13<br>22.0 | 6<br>11.8 | 9<br>30.0 |
| 2. Assessment Course and Other Course | 8<br>19.0 | 22<br>37.9 | 13<br>28.3 | 11<br>17.5 | 20<br>30.8 | 20<br>32.3 | 19<br>30.6 | 18<br>30.5 | 17<br>33.3 | 9<br>30.0 |
| 3. Assessment Course and Inservice | 0<br>0.0 | 1<br>1.7 | 1<br>2.2 | 2<br>3.2 | 2<br>3.1 | 1<br>1.6 | 1<br>1.6 | 0<br>0.0 | 3<br>5.9 | 1<br>3.3 |
| 4. Other Course and Inservice | 4<br>9.5 | 2<br>3.4 | 2<br>4.3 | 1<br>1.6 | 3<br>4.6 | 3<br>4.8 | 2<br>3.2 | 0<br>0.0 | 2<br>3.9 | 2<br>6.7 |
| 5. Assessment Course only | 7<br>16.7 | 7<br>12.1 | 7<br>15.2 | 10<br>15.9 | 6<br>9.2 | 15<br>24.2 | 5<br>8.1 | 10<br>16.9 | 10<br>19.6 | 5<br>16.7 |
| 6. Other Course only | 10<br>23.8 | 10<br>17.2 | 6<br>13.0 | 7<br>11.1 | 7<br>10.8 | 2<br>3.2 | 6<br>9.7 | 7<br>11.9 | 3<br>5.9 | 2<br>6.7 |
| 7. Inservice only | 1<br>2.4 | 0<br>0.0 | 0<br>0.0 | 1<br>1.6 | 3<br>4.6 | 2<br>3.2 | 0<br>0.0 | 2<br>3.4 | 0<br>0.0 | 0<br>0.0 |
| 8. None | 9<br>21.4 | 5<br>8.6 | 10<br>21.7 | 15<br>23.8 | 15<br>23.1 | 9<br>14.5 | 13<br>21.0 | 9<br>15.3 | 10<br>19.6 | 2<br>6.7 |

N=538

The total number and percent of survey respondents with training in classroom assessment by their source of training is presented in Table 14. The data in the table show that sources of training category two, assessment course and other course, has the highest percentage (28.8) of respondents, while category seven, inservice only, has the lowest percentage (1.7) of respondents. Further, 18.6 percent of respondents received training in category one, assessment course, other course, and inservice while 32.6 percent of the respondents received training in classroom assessment from a single source (categories five, six, and seven. An additional 17.3 percent of all survey respondents are teaching in Maryland's high school classroom with no training whatsoever in classroom assessment from any of the three sources identified in this research.

Table 14
Total Number and Percent of Survey Respondents by Sources of Training

| Sources of Training | Number of Respondents | Percent of Respondents | Cumulative Percent |
|---|---|---|---|
| 1. Assessment course, Other course, and Inservice | 100 | 18.6 | 18.6 |
| 2. Assessment course and Other course | 155 | 28.8 | 47.4 |
| 3. Assessment course and Inservice | 12 | 2.2 | 49.6 |
| 4. Other course and Inservice | 21 | 3.9 | 53.5 |
| 5. Assessment course only | 79 | 14.7 | 68.2 |
| 6. Other course only | 60 | 11.2 | 79.4 |
| 7. Inservice only | 9 | 1.7 | 81.1 |
| 8. None | 93 | 17.3 | 98.4 |
| Missing N=538 | 9 | 1.7 | *100.1 |

Note: *Total exceeds 100 percent due to rounding.

## Summary and Conclusions

The findings of our research suggest that almost one in five high school English/language arts, mathematics, science, and social teachers in Maryland report they have no training whatsoever in classroom assessment. When the percent of teachers with no training in classroom assessment is combined with the percent of teachers who have training in classroom assessment from only a single source (assessment course, other course, and inservice course), it is found that 46.5%, or almost half of them have no training or training from a single source. The lack of, or sparsity in, teachers' training in classroom assessment, that was consistent across five demographic variables (race, sex, subject taught, number of years taught, and total sample) found in our research is of great concern since competence in classroom assessment has been identified as significant to successful teaching and assessment is likely to comprise an even larger part of teachers' professional activities in the future. These findings are not unlike those of others referenced earlier in this paper concerning the little amount of training teachers are required to and receive in classroom assessment.

This very serious and alarming situation is only further exacerbated by the fact that whatever training in classroom assessment does take place in colleges/universities/or through inservice for prospective and current teachers, it does not to any extent guarantee that teachers' are knowledgeable and skillful users of effective classroom assessment techniques.

To illustrate the magnitude of this problem, consider that, in practical terms, this study suggests that about 18 of every 100 teachers; 180 of every 1,000 teachers; 1800 of every 10,000 teachers, etc. in this country have no training in the critical area of classroom assessment. Are teachers ready or not for "center stage?" Probably not; since many if not most were never ready for their traditional assessment roles.

## Implications

Because of the findings of this other research, and because the demands that will be made on teachers in the future concerning knowledge about and skill in using effective classroom assessment techniques, a compelling need exists for policy-makers and planners in teacher training colleges and universities, as well as in state teacher certification agencies and K-12 school systems, to make substantive changes in their programs and licensing regulations for teachers that will ensure that teachers are, indeed, knowledgeable and skillful users of classroom assessment techniques.

### Assuring Teachers' Competence in Classroom Assessment

Possible implications of the findings and conclusions of this research must be viewed within the context of other factors that are known about teachers, teaching, and classroom assessment. For example, research has shown that teachers historically and to the present have very little formal training in classroom assessment (Woellner, 1979, Schafer and Lisitz, 1987), and yet they use up to 25 percent of class time for assessment activities (Yeh, 1980). Moreover, what training they do have in assessment is generally one or two courses in "tests and measurement" which deal primarily with measures of central tendencies and other similar statistical concepts (Schafer and Lisitz, 1987).

High school teachers' roles in statewide assessment may well change in the future as assessments that blur the line that currently exists between assessment and instruction become reality. This point is especially important since in the future the beginning and ending of assessment activities and instructional activities will be purposely difficult to find because the two activities will be so entwined and commingled. The movement toward blending assessment and instruction in public education is intended to provide more authentic and accurate assessments of "what students know and can do with what they know" in order to inform the public as well as policy makers about the effectiveness of education systems at state and local levels. In addition, the connection between assessment and instruction as described above is thought to make best use of valuable instructional

time since new assessments are likely to be designed as vehicles for the delivery of effective instruction as well as being data providers about school effectiveness.

The above considerations strongly suggest that teachers in the public high schools of the future will make more use of classroom assessment activities than they currently do. Thus, the majority of current and soon-to-be teachers will need further training in classroom assessment in order to become the skillful assessment practitioners that will be a major role of teachers in the coming years. This includes new and experienced teachers since, as was concluded from the findings of this research, the amount of training teachers have does not seem to vary according to the number of years they have taught. Therefore, newly inducted teachers, teachers in mid-career, and teachers in the later part of their careers will need increased knowledge and skills in classroom assessment.

To assure that teachers have these critical assessment skills will require changes in the state teacher certification standards. For example a State Department of Education could propose policy changes that, if adopted by its State Board of Education, will ensure that teachers in that state, in the near future, are knowledgeable about and skilled users of effective classroom assessment techniques. One possibility for a State Board of Education is for it to adopt By-law changes related to the certification and re-certification of teachers in the state as it relates to their being able to demonstrate they are knowledgeable and skillful practitioners of effective classroom assessment techniques.

This might be accomplished through several means. For example, through By-law changes, the State Board of Education can require the demonstration of this knowledge and skill as a requisite for state certification and renewal of teachers' teaching certificates. This action raises the question "How would teachers (principals and supervisors, too!) demonstrate their knowledge and skill in classroom assessment?" Would it be accomplished through college or university, or inservice credit count or might they demonstrate their knowledge and skill in classroom assessment through an actual performance assessment?

It may be possible for the State Department of Education to conduct activities that would require the demonstration of knowledge and skills in classroom assessment by teachers wishing to become certified to teach in the state. It may also be possible to determine teachers' knowledge and skills in classroom assessment through a process that models the very techniques about which teachers are expected to be knowledgeable and skillful -- performance assessment.

The preparation of teachers for the above assessment could take several forms. For example, the State Department of Education could train and certify teacher coaches in each school system in the state who in turn could coach current teachers at the local level in preparation for the "state certification assessment" in classroom assessment. Another example could be the establishment of "courses" or "seminars" in classroom assessment at colleges and universities in the state. These courses or seminars could be offered by teams of college/university, school system, and State Department of Education personnel. The purpose of the courses or seminars would be to prepare teachers for a "statewide certification assessment" in classroom assessment.

For prospective teachers, undergraduate education programs could be modified to ensure that graduates have the knowledge and skill necessary to be successful on a "state classroom assessment" certification assessment. Moreover, in addition to meeting the current certification requirements of passing the National Teachers' Exam, and meeting degree, credit count, and student teaching, prospective teachers would also be required to be successful on the suggested "State Classroom Assessment" assessment in order to become certified to teach in the state.

Through by-law amendments, different from those previously referenced, policy makers could also take a major step toward ensuring that teachers are knowledgeable and skillful users of effective classroom assessments by making changes in teacher preparation programs in post-secondary institutions. Those by-law changes could have as an outcome

teacher preparation programs that produce soon-to-be teacher graduates who possess thorough knowledge and can demonstrate superior skills in classroom assessment.

At the local school system level, each school system in the state could also develop and implement a training program that had as a goal the retrofitting with classroom assessment knowledge and skills all current teachers within their school system. Collegial teams of teachers could work together within individual schools or between or among schools; individual teachers could coach or mentor other teachers; knowledgeable and skillful principals could work with teachers on their staffs, teachers on other school staffs, or with other principals and assistant principals; curriculum supervisors could conduct specific professional development activities for subject area teachers that had classroom assessment as their focus; local staff development personnel could offer and conduct, in collaboration with teachers and principals, workshops, seminars, drop-in sessions, all focusing on classroom assessment. Individual school districts could also call on local college and university personnel to collaborate with them in the planning for and delivery of training activities for current teachers.

Too, local school systems could develop activities other than those above which would serve the purpose of ensuring that teachers in their system are very knowledgeable about and highly skilled in classroom assessment activities. Local school systems could also build in incentives for teachers and principals who become experts in this crucial topic. Those incentives could be in a financial form or another form that provided a high degree of recognition for the professional competence of those teachers and principals.

The "bottom line" is that State Boards of Education can mandate changes that will result in teachers becoming very knowledgeable about and highly skillful in the use of classroom assessment techniques. These changes could take several different forms, including the certification and re-certification of high school teachers; however, the point is that if State Boards of Education believe it is critical for high school teachers in the state to be highly skilled in classroom assessment, then it must consider making changes that will

In the past when a State Board of Education wished to accomplish high priority policy goals and objectives it has made significant changes that now serve as precedents in order to do so. For example, in Maryland during the past decade the State Board of Education placed a high priority on having all teachers in the state become knowledgeable about two specific topics; reading and special education. As a result of a strongly held belief in the importance to the education system in the state and the students it serves, the Maryland State Board of Education employed a policy strategy that required, and continues to require, all Maryland teachers to have training in special education and reading. This training is verified by college, university, or inservice credit count and is directly linked to certification and re-certification requirements. Through this previous action, the State Board of Education ensured that Maryland teachers obtained the training it felt important for them to have and in a relatively short period of time its objective was accomplished.

The above example is intended to be illustrate how a State Board of Education can make changes that influence teachers, students, and the outcomes of education in the state, and to suggest that it can be done again in the essential area of classroom assessment. As a result of its action, and in very short order, a state priority of assuring that teachers are knowledgeable and skillful users of an effective array of classroom assessment techniques can be promoted and accomplished. This is important to the students in terms of the outcomes of their education, and if State Boards of Education, through their State Departments of Education, take the action suggested above, or some similar action that will result in the intended outcomes, it can compliment other school improvement efforts currently under way and leverage even further gains in student performance, teacher competence, and in public confidence in the state's school system.

Moreover, local school systems may be able to seize upon what might be a brief window of opportunity to significantly improve the quality of teaching and learning for teachers and students through participation in a creative and significantly different collaborative effort with the their State Departments of Education and state colleges and

universities. This can be an opportunity for local school systems to be active participants in the determination of the direction of education not only in their school systems, but in the direction of statewide public education as well. A pro-active approach to change and innovation may prove to be more beneficial to local school systems and to the state than reactive approaches that are sometimes used. This collaboration could have as its centerpiece the goal and associated programs that will equip prospective and current teachers with an effective array of assessment skills and techniques that will become so entwined with and important to instruction that student outcomes in the future will be significantly higher than they currently are.

Post-secondary institutions may also find the changes in certification requirements for teachers that are suggested above, and other possible changes related to teacher preparation programs, to be an exhilarating opportunity to break set from a few of the traditions that may have been adequate in the past but that may not be adequate in the future.

Post-secondary institutions can play a major role in the training and re-training of in so far as providing them with the knowledge and skills in classroom assessment that have been suggested above. In fulfilling such an important training role for teachers, through the partnerships suggested, post-secondary institutions will contribute in a major way to current school improvement efforts .

Should colleges and universities fail to modify teacher preparation programs so their graduates are knowledgeable and skillful practitioners of effective classroom assessment, it is likely they will be preparing teacher candidates who will be unable to teach in public schools. The likelihood that those who teach in classrooms in the near future will need these skills is great, and it may be a propitious time for change in teacher preparation programs.

Moreover, post-secondary institutions may have a unique opportunity to be active participants in the school improvement activities that are under way in, including the

activities that have been alluded to in this research. Post-secondary institutions provide a significant amount of the inservice education received by teachers, and these are important to the success of K to 12 public education. Through possible changes in those programs, post-secondary institutions can support and enhance the efforts of the State Departments of Education and local school systems; thus, an increase in their service commitment to the state and local school systems may result that could be beneficial to all participants.

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